```
#!pip install easyocr
#!pip install imutils

import cv2
import numpy as np
import matplotlib.pyplot as plt
import imutils
import easyocr
```

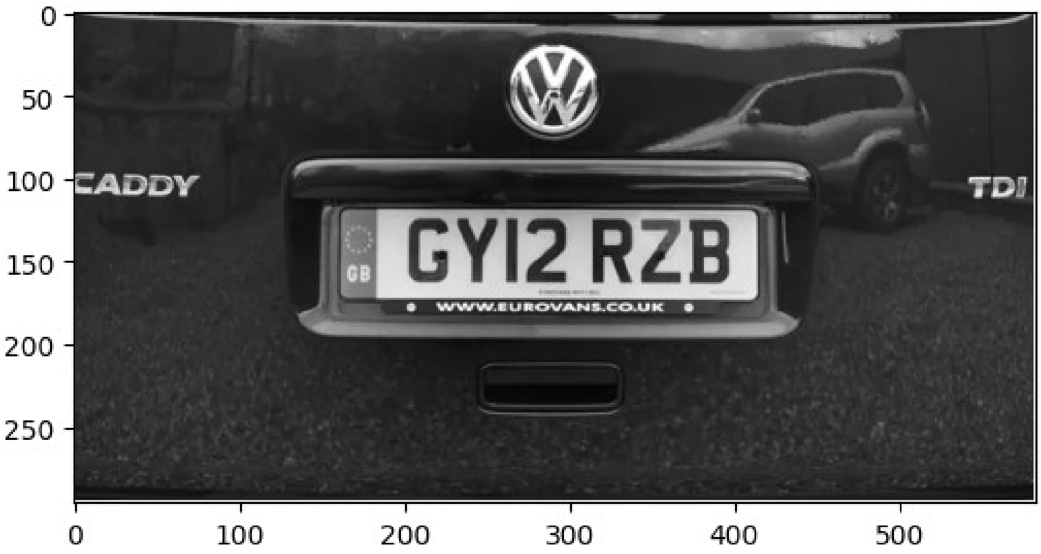
Reading an Image

```
img = cv2.imread('car.png')
```

```
gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
```

```
plt.imshow(cv2.cvtColor(gray, cv2.COLOR_BGR2RGB))
```

```
<matplotlib.image.AxesImage at 0x7f3cd8552b00>
```

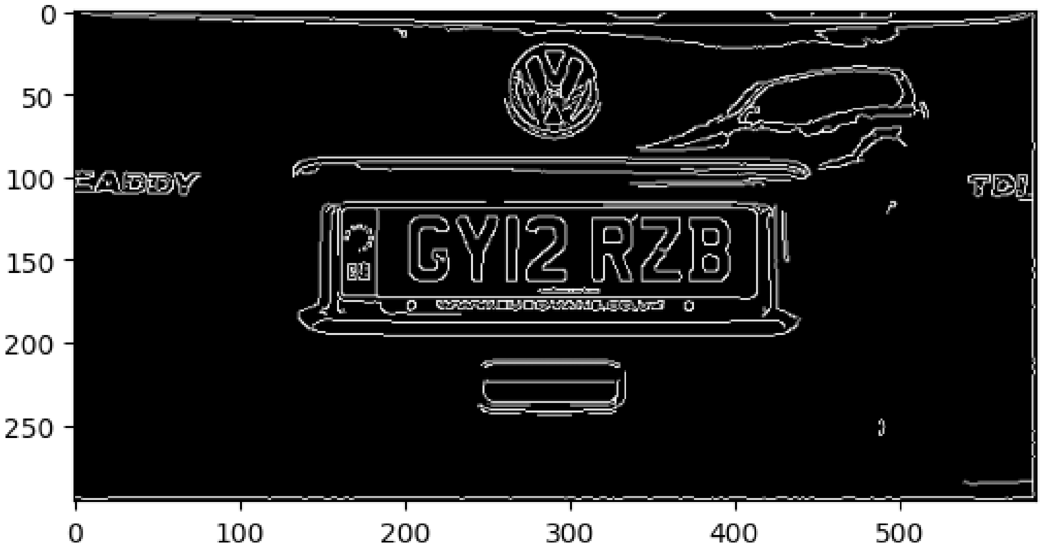


```
bfilter = cv2.bilateralFilter(gray, 11, 11, 17)
```

```
edged = cv2.Canny(bfilter, 30, 200)
```

```
plt.imshow(cv2.cvtColor(edged, cv2.COLOR_BGR2RGB))
```

```
<matplotlib.image.AxesImage at 0x7f3cd845dc30>
```

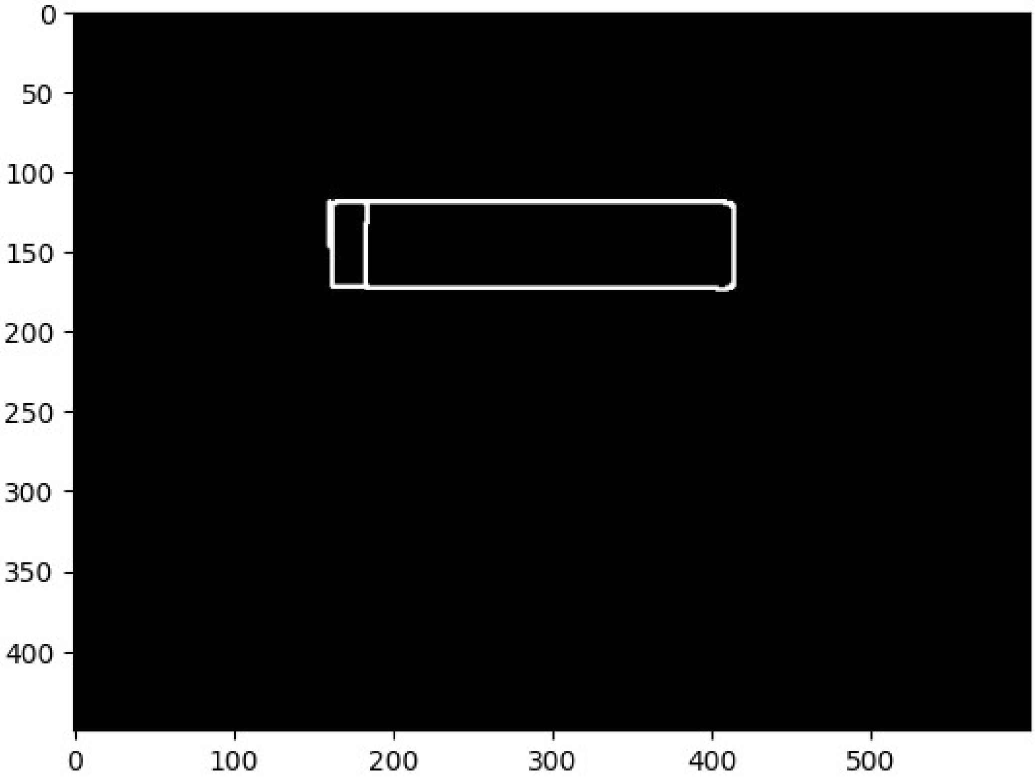


```
keypoints,hierachy = cv2.findContours(edged.copy(), cv2.RETR_TREE,
cv2.CHAIN_APPROX_SIMPLE)
```

Ideally, in number plate recognition, we should get 4 key points from contour

```
contours = keypoints

# Create a blank image
blank_image = np.ones((450,600,3), np.uint8)

# Set the minimum area for a contour
min_area = 5000

# Draw the contours on the original image and the blank image
for c in contours:
    area = cv2.contourArea(c)
    if area > min_area:
        cv2.drawContours(blank_image,[c], 0, (255,255,255), 2)

plt.imshow(blank_image)
```

```
<matplotlib.image.AxesImage at 0x7f3cd84fd3f0>
```



```
len(contours)
contours = sorted(contours, key = cv2.contourArea, reverse = True)
[:10]
len(contours)
```

```
10
```

```
location = None
for contour in contours:
  # cv2.approxPolyDP returns a resampled contour, so this will still
return a set of (x, y) points
  approx = cv2.approxPolyDP(contour, 10, True)
  print("approx",approx)
  print("len",len(approx))
  if len(approx) == 4:
    location = approx
    break
```

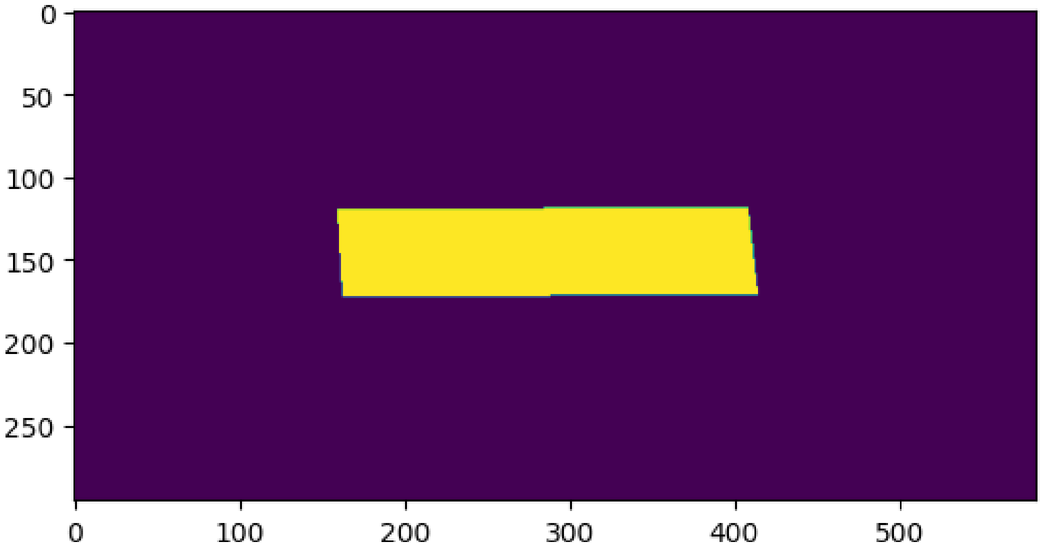
```
approx [[[160 120]]

 [[163 172]]

 [[414 171]]
 [[408 119]]]
len 4
```

```
mask = np.zeros(gray.shape, np.uint8)
```

```
new_image = cv2.drawContours(mask, [location], 0, 255, -1)
```

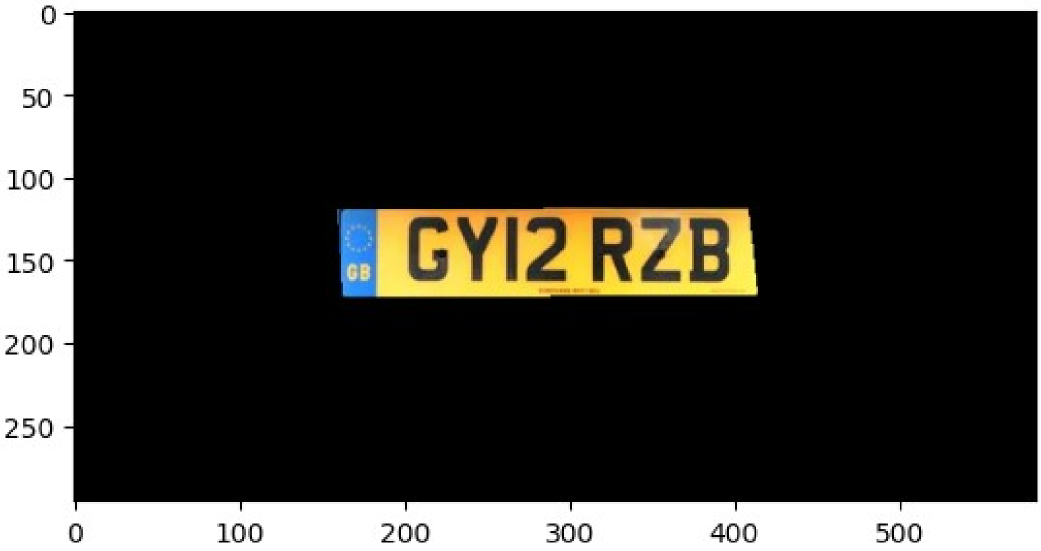
```
plt.imshow(new_image)
```

```
<matplotlib.image.AxesImage at 0x7f3cd8380cd0>
```



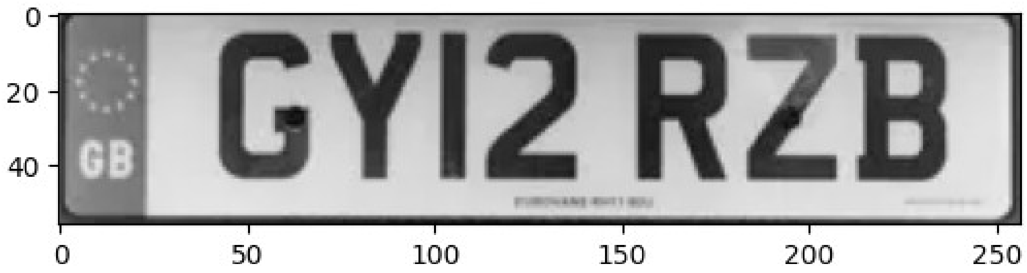
```
new_image = cv2.bitwise_and(img, img, mask = mask)
plt.imshow(cv2.cvtColor(new_image, cv2.COLOR_BGR2RGB))
```

```
<matplotlib.image.AxesImage at 0x7f3cd84010f0>
```



```
(x, y) = np.where(mask != 0)
(x1, y1) = (np.min(x), np.min(y))
(x2, y2) = (np.max(x), np.max(y))
# Adding Buffer
cropped_image = gray[x1:x2+3, y1:y2+3]
plt.imshow(cv2.cvtColor(cropped_image, cv2.COLOR_BGR2RGB))
```

```
<matplotlib.image.AxesImage at 0x7f3cd8280910>
```

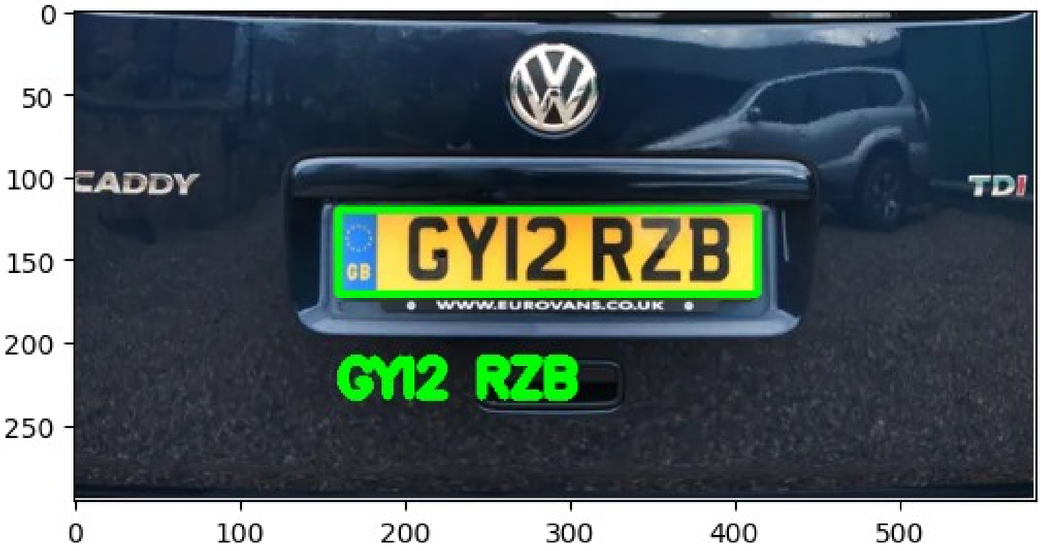


```
reader = easyocr.Reader(['en'])
result = reader.readtext(cropped_image)
```

```
WARNING:easyocr.easyocr:CUDA not available - defaulting to CPU. Note:
This module is much faster with a GPU.
```

```
text = result[0][1]
font = cv2.FONT_HERSHEY_SIMPLEX
res = cv2.putText(img, text = text, org = (approx[0][0][0], approx[1]
[0][1]+60), fontFace = font, fontScale = 1, color = (0, 255, 0),
thickness = 5)
res = cv2.rectangle(img, tuple(approx[0][0]), tuple(approx[2][0]),
(0,255, 0), 3)
plt.imshow(cv2.cvtColor(res, cv2.COLOR_BGR2RGB))
```

```
<matplotlib.image.AxesImage at 0x7f3cd867c580>
```


0
50
100
150
200
250
0
100
200
300
400
500
CADDY
TDI
GB
GYI2 RZB
WWW.EUROVANS.CO.UK
GYI2 RZB